

EJVES Extra xx, 1–3 (xxxx)

doi:10.1016/j.ejvsextra.2005.02.011, available online at <http://www.sciencedirect.com> on **SCIENCE @ DIRECT®**

## SHORT REPORT

# Endovascular Control of a Ruptured Proximal Superior Mesenteric Artery Pseudoaneurysm

**I.I. Galaria, S.M. Suroweic and M.G. Davies\****Division of Vascular Surgery, Center for Vascular Disease, University of Rochester, Rochester, NY 14642, USA**We describe a successful coil embolization of a bleeding superior mesenteric artery pseudoaneurysm.*

### Introduction

Pseudoaneurysms of the superior mesenteric artery are rare; only a few reports describe such lesions and its treatment. This case successfully describes an endovascular treatment approach that can potentially stabilize and treat patients with these lesions even in the presence of active symptoms.

performed and coil embolization of the pseudoaneurysm achieved (Fig. 1(C) and (D)). The initial SMA arteriogram revealed an abnormal characteristic of the distal mesenteric vessels suggestive of vasculitis (Fig. 1(A)). An open jejunal biopsy revealed no evidence of vasculitis, however. The patient is doing well a year following his procedure with no abdominal symptoms.

### Case Report

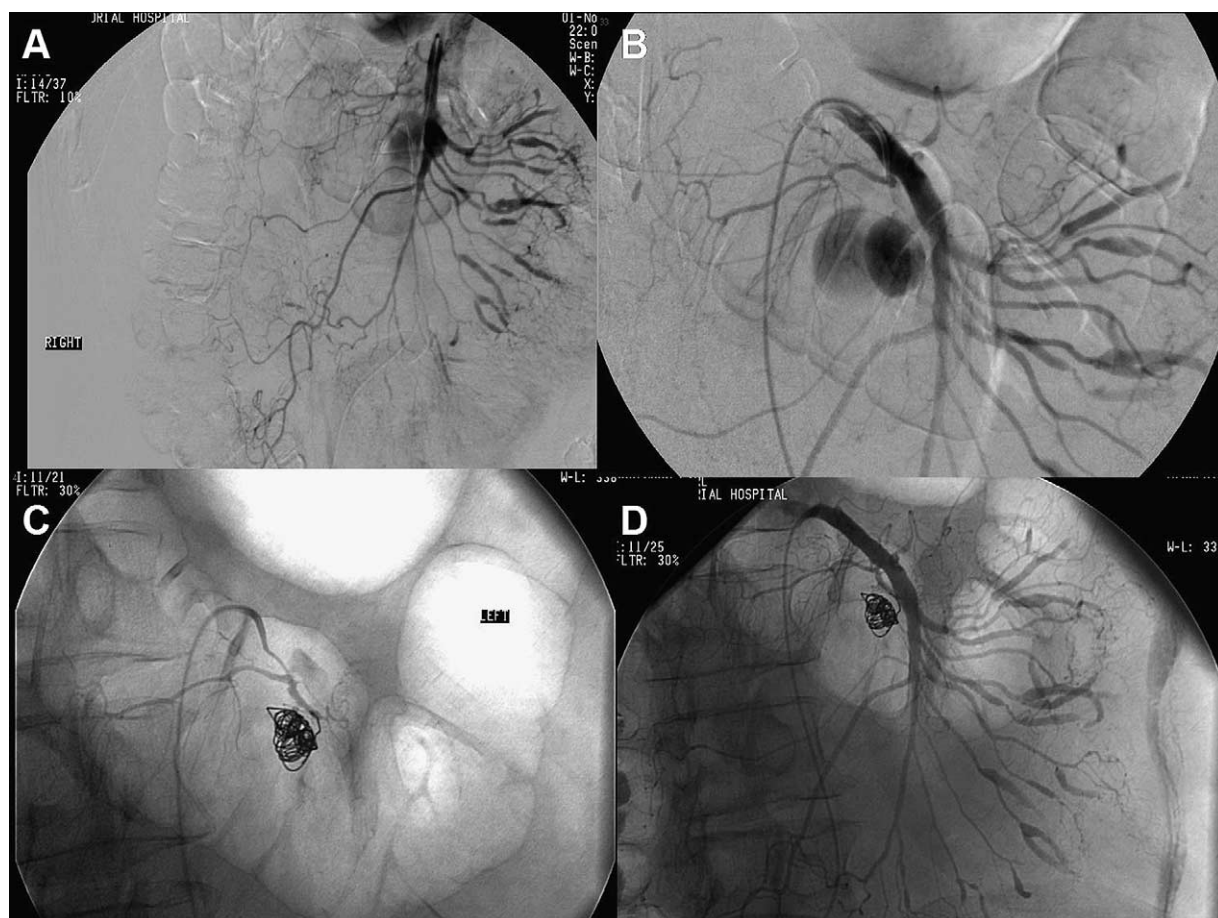
A 78 year male presented to an outside institution with hypogastric pain and anemia. He has steroid dependent rheumatoid arthritis, atrial fibrillation for which he is on warfarin therapy, chronic renal insufficiency, congestive heart failure—American Heart Association Class II, and chronic obstructive pulmonary disease. A screening abdominal computed tomography scan revealed a proximal superior mesenteric artery (SMA) pseudoaneurysm with blood within the transverse mesentery (Fig. 1(A)). His condition stabilized after he had received two units of packed red blood cells. Forty-eight hours later he had rebled and was transferred to our institution. An arteriogram on arrival demonstrated a bilobular SMA pseudoaneurysm (Fig. 1(B)). Selective catheterization of the SMA and the feeding branch of the aneurysm was

### Discussion

The incidence of superior mesenteric artery pseudoaneurysms is rare, more so than the incidence of superior mesenteric artery aneurysms which occur at a frequency of one in 12,000 to one in 19,000 cases. However, in recent years, the rate of diagnosis has increased due to the rise in abdominal imaging.<sup>1,2</sup> Pancreatitis, trauma, and vasculitis are among the most frequent causes of these pseudoaneurysms. Bacteria or fungi, unlike in SMA aneurysms, are not as often found.<sup>3,4</sup> Unlike other visceral aneurysms, 52–90% of SMA aneurysms are symptomatic on presentation.<sup>3,5</sup> These patients classically experience vague, intermittent abdominal pain or intermittent gastrointestinal bleeding. Diagnosis can be made by MRI, CT or abdominal ultrasound, however, none of these imaging modalities are as sensitive as mesenteric angiography.<sup>6</sup> Particularly, in patients with a vasculitis, diagnosis may be especially difficult due to the potentially smaller sizes of the aneurysms/

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**Fig. 1.** (A) and (B) An arteriogram demonstrating a proximal superior mesenteric artery pseudoaneurysm. (C) and (D) An arteriogram immediately following coil embolization of the pseudoaneurysm.

pseudoaneurysms that are often undetected by studies other than arteriography.<sup>7</sup>

There is no definitive study that documents the course of a visceral pseudoaneurysm; however, based upon case series and case reports, immediate intervention is recommended because of their unpredictable course and their relatively high rate of complications.<sup>8</sup> The most feared consequence is hemorrhage which, by some estimates, occurs ultimately in almost half of these patients. The mortality rate, 12.5–37% when treatment is attempted, can reach almost 90% without intervention.<sup>9</sup> Traditionally, pseudoaneurysms were approached and treated in the same manner as true aneurysms; they were either excluded through open surgery or bypassed with the placement of a stent. Nonetheless, endovascular therapy has gained favor, and these lesions—unlike true aneurysms—can be frequently treated with embolization.

Three recent series of endovascular treatment of SMA aneurysms by coil embolization have shown technical success rates between 79 and 100% with

recanalization of only 16%.<sup>8,9</sup> Embolization is specifically favored in patients with saccular aneurysms and in those patients with sufficient collateral blood flow. Embolization has also been used as a stopgap measure to stabilize a bleeding patient pending more definitive intervention, if necessary.<sup>6,8</sup> Patients who have a pseudoaneurysm secondary to an inherent inflammatory condition require more aggressive and extensive embolization to ensure that potentially weak vessel tissue adjacent to the pseudoaneurysm are preemptively treated.<sup>8</sup>

Case reports within the past few years describe the success of intravascular deployed stents in the management of superior mesenteric artery pseudoaneurysms.<sup>1,10–12</sup> However, stents can migrate, and they are also at risk of thrombosis particularly in patients with vasculitis, who may be hypercoagulable.<sup>13</sup> Further, stents can become contaminated, particularly if placed at a site of infection. Inserting an autogenous vein covered stent in a contaminated or potentially contaminated site could be more effective and safer.<sup>14</sup>

The long-term success of embolization for the

treatment of SMA pseudoaneurysm still needs to be confirmed, but this case along with a few others suggest that embolization should be the preferred treatment option in these patients even in cases of active bleeding. At present, the use of stents should be reserved for a few, select patients with poor collateral blood flow, as an example, because of its higher risk of potential complications particularly in patients with SMA pseudoaneurysms.

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Accepted 17 February 2005